2007 BIOPESTICIDE RESEARCH PROGRAM GUIDELINES AND GRANT PROPOSAL APPLICATION FORMS

(Proposals due November 14, 2006)

Each year we try to improve the grant announcement to clarify what we are looking for and provide additional guidance about the process to prospective applicants. If you have any questions or suggestions for improvement please contact Michael Braverman Braverman@aesop.rutgers.edu .

Please note

Encouragement of proposals to address high priority needs. *See page 11*.

Common questions and answers about the program. *See page 12.*

Grant contact information form. *See page 17.*

Treatment lists and suggested experimental designs. *See page 37.*

Listing of last years approved projects. *See page 41*.

Only one copy of the proposal is requested.

Biopesticide Research Program

Background

The IR-4 Project is funded by the USDA agencies CSREES and ARS and receives support from the directors of state agricultural experiment stations. IR-4 is an applied research program whose mission is to assist specialty crop producers obtain safe and effective pest control products. The program was initiated in 1963 and historically has focused on registration and reregistration of pest management tools for use on specialty crops or for minor uses on major crops.

IR-4 broadened its scope in 1982 to include research leading to registration of a wide range of biopesticides including microbials, nonviable microbials, biochemicals, genetically altered microbials, and transgenic plants. The program is committed to developing alternative pest control products on specialty food crops and ornamentals by working cooperatively with public and private sector individuals and organizations. IR-4 interacts with the USDA, EPA, and product registrants to determine the requirements for registration of proposed uses. The program has the resources to develop research protocols, assist with Experimental Use Permits, coordinate and fund field and greenhouse research, assist in the development of Tier I toxicology and non-target organism waivers, and prepare data packages for submission to the EPA.

The EPA under FIFRA regulates all materials that claim to have pesticidal properties. In the biopesticide area, these include microbials such as fungi, bacteria, and viruses, low toxicity biochemicals, pheromones, insect and plant growth regulators, genetically modified microbials, and pesticidal plants. In general, the number and type of studies required to register these products are different from the studies required to register conventional products. To be considered under EPA's biological criteria, biochemicals must have a unique mode of action and be either naturally occurring or a synthetic analog. IR-4 will consider biochemicals that meet the EPA definition as well as other low exposure, naturally occurring biochemicals which have pest control activity, provided they are considered safe and do not have significant toxicity to man, mammals, fish or birds.

Biologicals such as arthropod (insect) parasites and predators or predacious nematodes are not regulated under FIFRA and do not fall under the IR-4 program.

IR-4 Assistance for Biopesticide Projects

The primary objective of the IR-4 Biopesticide Research Program is to further the development and registration of biopesticides for use in pest management systems for specialty crops or for minor uses on major crops. Areas of IR-4 assistance include:

1. Develop an approved research protocol.
2. Fund small and large scale field efficacy trials.
3. Fund magnitude of residue trials, if needed.
4. Assist in obtaining Experimental Use Permits from the EPA.
5. Prepare and submit petitions to the EPA to support clearances.
6. Develop efficacy data to expand currently registered products to include additional crops and uses.
7. Prepare registration documents for submission to the EPA.

IR-4 Biopesticide Grant Program

General guidelines and submission of biopesticide grant request forms:

The general guidelines that will be used to initially review a proposed biopesticide grant request are shown in Appendix I. A proposal for financial assistance from our grants program must include biopesticide grant proposal forms. Incomplete or late forms will not be considered. Blank forms are also available from the IR-4 website www.ir4.rutgers.edu/ listed under Call For Proposals.

Submission of research proposals:

Proposals are invited for Early Stage as well as Advanced Stage biopesticides. Potential registrants are strongly encouraged to cooperate with public institutions in proposal submission; however proposals submitted solely from a company will not be considered. Early Stage biopesticides are biopesticides for which EPA subpart M Tier I data requirements are not completed or satisfied by appropriate waivers (Ask registrant or see EPA website http://www.epa.gov/pesticides/biopesticides/regtools/guidelines/index.htm).

Most Advance Stage Proposals involve products that are already registered with the EPA and involve label expansion such as adding a new crop or new pest to the label. Research on existing labeled uses are funded under the demonstration stage program. Grant requesters are encouraged to interact with their IR-4 Regional Field Coordinator (see page 10) and the potential registrant prior to developing and submitting a proposal. All completed proposals should be submitted to the Manager of the IR-4 Biopesticide Program at IR-4 Headquarters. Proposals will then be reviewed for merit by IR-4 internal and external reviewers based on the criteria shown in Appendix III (Early Stage Proposals) or Appendix IV (Advanced Stage Proposals). Late or incomplete proposals will not be considered.

Selection of projects for funding:

Comments from the internal and the external reviewers will be summarized and a recommendation for funding will be made by the IR-4 Biopesticide Research Grant Review Committee to the IR-4 Project Management Committee (PMC). The PMC will authorize all funding decisions. If a Section 18 or Experimental Use Permit is needed to conduct the research, the permit must be in place in time to conduct the research.

Notification of Project Funding:

The IR-4 Biopesticide Program Manager will notify the requestor of the funding decision by the IR-4 PMC, usually by March of the funding year.

Progress reports:

Annual progress reports are required if the research is not completed within one year. Otherwise, a final report is required. All reports should be sent to the Regional Field Coordinator and the IR-4 Biopesticide Program Manager. Reports should follow a standard scientific format of an abstract, introduction, materials and methods, a statistical analysis of the data in tabular or graphic format, and discussion-conclusions. Reporting requirements are attached to the end of the grant announcements.

Continuation Grants/Renewal Grants:

IR-4 will commit research funds for only one year at a time. In order to receive funding beyond the first year, the grantee must submit a new grant request for continuation of funding, a progress report on research conducted under the existing grant, justification for continued funding, and a plan of work to be carried out under the continued grant. For projects in which data are not generated until after the due date for next years grant, it is suggested to submit the data as soon as possible for consideration by the committee. Projects which do not generate data within the grant cycle will be at a competitive

disadvantage for an additional years funding. If positive efficacy data are generated later in the year, the proposal can be resubmitted for a subsequent funding cycle. Early Stage Proposals are funded on an annual basis for a maximum of 2 years and Advanced Stage Proposals are funded for a maximum of 3 years.

Decisions regarding continued support and the actual funding levels are made by the IR-4 Biopesticide Research Grant Review Committee and PMC after consideration of such factors as grantee's progress, availability of funds and likelihood of grower adoption.

Appendix I
General Guidelines

- The biopesticide must be subject to registration under the Federal Insecticide, Fungicide, and Rodenticide Act as Amended. Biopesticides include microbials, nonviable microbials, biochemical pesticides including pheromones, attractants, insect growth regulators, plant growth regulators, and other compounds such as natural products, but do not include naturally occurring parasites or preditors. **For a list of active ingredients considered to biopesticides by EPA**, see www.epa.gov/pesticides/biopesticides/product_lists/bppd-prods-12-16-05.pdf

- IR-4 will support the development of data for the registration of a biopesticide where the need is in the public interest, there is reasonable potential for commercial production and the use involves a specialty crop or a minor use on a major crop. There should be clear registrant and grower support. This program includes ornamental as well as food crops.

- In efficacy studies, an integrated approach looking at the role of biopesticides as resistance management tools in rotation with conventional chemical products is strongly encouraged. The experimental design should enable the evaluation of the individual products in addition to rotational treatments.

- Preliminary data are available supporting efficacy against target pest(s).

- A production method is feasible and there is potential for a commercially formulated product.

- Practical application technology exists.

- The use pattern is compatible with other agricultural practices.

- The host range and pathogenicity are known and safety data to protect the researcher exists.

Appendix II

An electronic copy of the Biopesticide Grant Proposal Form is available at the following site: (See Call For Proposals.)

www.ir4.rutgers.edu/ listed under Call For Proposals.

Appendix III
Criteria for Evaluation of Formal Proposals For Early Stage Biopesticides*

The following criteria were established to assist the reviewers in selecting biopesticide projects for funding that: (1) have a high probability of being registered in a reasonable period of time, and (2) will be useful in meeting pest control needs involving specialty crops (uses), including minor uses on major crops.

1. Adequacy of investigators, facilities, experimental design, work plan and background research.

2. Evaluation of budget: amount requested from IR-4 and other support.

3. Time to completion and probability of attaining objectives in the proposed time frame.

4. Relevance of the proposal toward the development of data for registration.

5. Evidence of efficacy. Provide information on performance relative to conventional control practices and how the biopesticide might fit into Integrated Pest and Resistance Management Programs.

6. Availability of a potential registrant. Likelihood of developing a formulated commercial product.

*Early Stage biopesticides are biopesticides for which EPA subpart M Tier I data requirements are not completed or satisfied by appropriate waivers. (Ask registrant or see EPA website http://www.epa.gov/pesticides/biopesticides/regtools/guidelines/index.htm),

Appendix IV
Criteria for Evaluation of Advanced Stage Biopesticide Proposals

The following criteria were established to assist the reviewers in selecting biopesticide projects for funding that: (1) are either in a more advanced stage of development (as opposed to exploratory or early stage of development) or involve expansion of the label, (2) have a high probability of being registered/marketed in a reasonable period of time, and (3) will be useful in meeting pest control needs involving specialty crops (uses), including minor uses on major crops.

1. Adequacy of investigators, facilities, experimental design, work plan and background research.

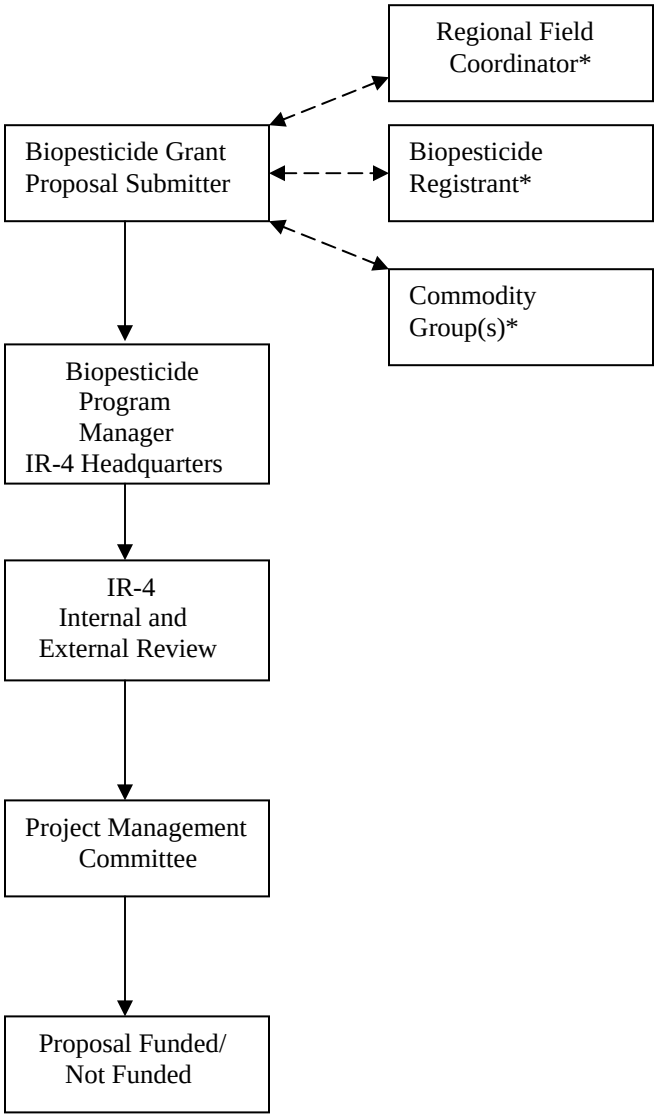
2. Evaluation of budget, including matching funding from registrant and/or commodity group(s).

3. Relevance of the proposal toward the development of data for registration or label expansion of the biopesticide.

4. Probability of biopesticide being used by growers (factors such as commitment of registrant, time to registration, availability of commercial formulation(s), effectiveness and economics of use rates should be considered).

5. The potential for integration of the biopesticide into a rotation with conventional products will also be considered as part of Integrated Pest and Resistance Management Programs.

Appendix V
General Scheme for Review of IPM Biopesticide Proposals



***It is strongly recommended to contact your Regional Field Coordinator *(refer to list on page 10)* while preparing and prior to submitting proposals. It is also recommended to contact the biopesticide company registrant (for technical support, co-funding) and/ or commodity group for funding, technical support or letters of support) prior to submitting proposals.**

REGIONAL FIELD COORDINATORS

Ms. Edith Lurvey
Regional Field Coordinator, Northeast Region Representative
Department of Food Science & Technology
New York State Agricultural Experiment Station
630 W. North Street
P.O. Box 462
Geneva, NY 14456
Tel: (315) 787-2308
Fax: (315) 787-2397
Ell10@cornell.edu **States: NY, DE, ME, MD, MA, NH, NJ, PA, RI, VT, WV, D.C.**

Dr. Charles W. Meister
Regional Field Coordinator, Southern Region Representative
Food & Env. Tox. Lab., IFAS
P.O. Box 110720, SW 23rd Dr.
University of Florida
Gainesville, FL 32611-0720
Tel: (352) 392-2399 ext. 412
Fax: (352) 392-1988
Cmeister@mail.ifas.ufl.edu **States: FL, AL, AR, GA, KY, LA, MS, NC, OK, SC, TN, TX, VA and the Virgin Islands and Puerto Rico**

Dr. Saturo Miyazaki
Regional Field Coordinator, Northcentral Region Representative
National Food Safety & Toxicology Center
Michigan State University
182 Food Safety & Toxicology Building
East Lansing, MI 48824-1302
Tel: (517) 353-9497
Fax: (517) 432-2098
ncrir4@pilot.msu.edu **States: MI, IA, IL, IN, KS, MN, MO, ND, NE, OH, SD, WI**

Dr. Paul Schwartz
USDA/ARS/Office of Minor Use Pesticides
BARC-W, ANRI, Bldg. 003, Room 325
10300 Baltimore Avenue
Beltsville, MD 20705-2350
Tel: (301) 504-8256
Fax: (301) 504-8142
schwartzp@ba.ars.usda.gov **All proposals from USDA**

Ms. Rebecca Sisco, Western Region Representative
Regional Field Coordinator
Western Region IR-4 Program
University of California
Dept. of Environmental Toxicology
One Shield Ave., Meyer Hall Room 4218
Davis, CA 95616
Tel: (530) 752-7634
Fax: (530) 752-2866
rsisco@ucdavis.edu **States: CA, AZ, CO, HI, ID, MT, NV, NM, OR, UT, WA, WY and Guam (All Pacific Island territories)**

IMPORTANT NOTE:

Selection of grant Stage

There are 2 sets of application forms.

The first set pertains to **Early** Stage and **Advanced** Stage Projects. The second set pertains to EPA/IR-4 **Demonstration** Projects. Many parts are similar so it is important to decide how the biopesticides you are testing relate to one of these 3 categories.

Early Stage: Biopesticide is not registered and has not completed needed toxicology studies. See **pages 14-26.**

Advanced Stage: Biopesticide is registered or has completed toxicology studies. Research must entail adding a new pest or new crop to a labeled product. **See pages 14-26.**

Demonstration Stage: Biopesticide is registered and labeled for use. Facilitate grower adoption through extension type on farm demonstration program. Refer to the second set of application forms. **See pages 27-36.**

2007 Priorities

In an effort to promote the integration the industry needs prioritized in the Food Use Workshop and emerging pest problems with the Biopesticide Program, IR-4 is encouraging proposals involving

- **Thrips management with bioinsecticides**
- ***Phytophtora capcisi* control with biofungicides**
- **Downy mildew control on cucurbits with biofungicides**
- **Soybean Rust* – Control on horticultural beans**
- **Q-biotype whitefly* management with bioinsecticides**
- **Plant bugs- Lygus, Stink bug, etc. with bioinsecticides**
- **Aquatic weed management with bioherbicides**
- **Seed treatments as an application method for biopesticides**

***Note : It is the researchers responsibility to document that pests are present in your area and that the research is compliant with APHIS regulations.**

Common Questions and Answers:

1Q: What if some of the products I want to evaluate are Early Stage and some are Advanced Stage products or some are Advanced Stage and some are Demonstration Stage.

1. A: First of all, carefully read the descriptions of the stages and ask your Regional Coordinator or the IR-4 Biopesticide Program Manager to help interpret the stage of the product. In general, it is better to keep your proposal qualified for a single stage. If you are looking at an Early Stage biopesticide, it should probably be compared to currently registered products, so explain the purpose of your treatments (designate them as standards). You can divide the treatments and submit similar proposals under different Stages. Mixtures of non-registered products in a Demonstration Stage is the most problematic.

2. Q: How do I know if the product I want to include in my proposal is considered to be a biopesticide.

2. A: In general we follow the EPA interpretation. If the product is an Advanced or Demonstration Stage product, then the active ingredient should be found at the following website: www.epa.gov/pesticides/biopesticides/product_lists/bppd-prods-12-16-05.pdf

If the product is an Early Stage product, contact the registrant or the IR-4 Biopesticide Program Manager. The products spinosad and pyrethrum are not biopesticides, although they may be part of a rotation program.

3. Q: I heard that IR-4 conducts research under Good Laboratory Practices (GLP). I'm not set up for GLP studies. Does IR-4 require that efficacy studies be conducted under GLP?

3. A: No. IR-4 expects researchers to conduct efficacy studies with same good scientific standards and quality they would normally practice, but not under GLP.

4. Q: What if I don't have any preliminary efficacy data on the products I want to research?

4. A: Ideally you will already have generated some preliminary efficacy data. You can ask the registrant if they have preliminary data or you may find some in the public literature. It may also be present in one of the annual reports at our website. The data should involve the same or similar crops and pests to those in the proposal. You can also bridge data from the most similar source available.

5. Q: If a crop is not on one brand of a label containing the same active ingredient as found on another label, can I utilize the narrower label and claim I am looking at label expansion?

5. A: No. If there is another product already filling that need, then the grower would not have a new tool, it would just be another copy of the same tool. If there are similar products that may be misinterpreted, clearly justify the differences.

6. Q: Does IR-4 fund research on genetically modified organisms for biocontrol?

6. A: There is no specific exclusion of genetically modified organisms, but the degree of commercial development is a consideration, as in all proposals.

7. Q: Does IR-4 fund projects on green manures, compost teas or cultural practices?

7. A: These types of products are not registerable as biopesticides by the EPA, therefore they are outside the scope of this grant program; however these can be blanket treatments as part of an overall system. We recognize that multiple approaches may be needed to obtain effective pest management and strongly encourage the development of an effective system. Proposals using these treatments as part of a system with biopesticides are encouraged, but proposals only containing products that are not biopesticides are not acceptable.

8. Q: Does IR-4 fund efficacy research involving predatory or parasitic insects or entomopathogenic nematodes?

8. A: Since these are not registerable with the EPA, they are not considered biopesticides. We would welcome the inclusion of these approaches as part of a system which has a majority focus on biopesticides, but not predators or parasites alone.

9. Q: Does IR-4 fund research on plant growth regulators

9. A: Yes, as long as they are biopesticide based PGR's

BIOPESTICIDE

EARLY AND ADVANCED STAGE

GRANT

PROPOSAL

FORMS

2007

(Proposals due November 14, 2006)

In addition to these forms, please include institutional approval; however do not delay submitting proposals awaiting institutional approval. Institutional approval is required before a grant can be awarded. Proposals are due November 14th, 2006. In addition to the forms, the electronic version may be used to directly answer the questions concerning the grant Stage, introduction and 12 sections of the experimental plan. **Please answer each question individually rather than developing a narrative of the entire proposal**. Other than the introduction, there are no maximum page requirements for the experimental plan.

Most successful grants have generally ranged from $5,000 to $10,000 with the largest grants generally around $20,000. For a list of projects funded for the 2006 growing season please see page 40.

Mail completed proposal to:

Dr. Michael Braverman, Biopesticide Program Manager
IR-4 Project, Rutgers University
500 College Road East, Suite 201W
Princeton, New Jersey 08540
Tel: (732) 932-9575 ext 4610
Fax: (609) 514-2612

Electronic copies should be e-mailed to: braverman@aesop.rutgers.edu

NOTE: All of these forms are required to apply for a biopesticide grant. Electronic submissions should be made as a single PDF file. IR-4 is not responsible for assembling individual files into a proposal.

Eligibility:

This grant is available to all U. S. public and private colleges and universities, USDA agencies, commodity groups, non-government organizations and contract research organizations. Preference is given to proposals from USDA and land grant institutions. Basic producers or registrants of biopesticides will not be funded, however collaboration with registrants is strongly encouraged. For projects in which data are not generated until after the due date for next years grant, it is suggested to submit the data as soon as possible for consideration by the committee. Projects which do not generate data within the grant cycle will be at a competitive disadvantage for an additional years funding. If positive efficacy data are generated later in the year, the proposal can be resubmitted for a subsequent funding cycle. If a proposal has received funding previously, note that Early Stage Proposals can be funded for a maximum of 2 years and Advanced Stage Proposals can be funded for a maximum of 3 years. Early Stage Proposals that become Advanced Stage Proposals through registration can receive up to an additional 3 years funding. In all cases, IR-4 only approves funding on a yearly basis and does not commit to multiple years of funding to an individual proposal.

IR-4 BIOPESTICIDE GRANTS COVER PAGE

2006

Proposal Number(For IR-4 Use):	Principal Investigator:
Proposal Title:	
Institution:	
Total dollars Requested (Year 1 only)	

Enter each biopesticide /crop/ pest combination

No.	Biopesticide and/or Conventional Product	Crop	Pest (Weeds, Diseases, Insects)	PR Number(For IR-4 Use)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
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24				
25				
26				

9/1/2006

Biopesticide Grants Contact Information Form

Proposal Title: _____

Name	Street	City/State	Zip+4	Phone Number & Fax Number	E-mail Address
Project Director (*Principal Investigator*):					
Administrative Contact:					
Financial Grant Officer:					
Authorized Grant Official:					
Individual Responsible for Invoicing: **Address**					

NOTE: THIS IS FOR INFORMATIONAL PURPOSES ONLY. THIS IS NOT MEANT TO BE SIGNED. DO NOT DELAY SUBMITTING YOUR PROPOSAL BY ATTEMPTING TO GET THIS SIGNED. THIS IS NOT MEANT AS A REPLACEMENT FOR ANY INSTITUTIONAL APPROVAL PAGES.

I. **<u>Grant Stage</u>** What is the grant Stage to which you are applying? Early or Advanced (Check appropriate line)

__ Early – Biopesticide not yet registered and has not completed the Tier I toxicology data requirements.

__ Advanced – the biopesticide is registered or at least has completed the Tier I toxicology data requirements.

If you are applying for any Advanced Stage Proposal, and the product is not currently registered with EPA, provide a list of the toxicology work that has been completed.

II. **<u>Introduction</u>** (***Limit 1 page***) include the objective, description of the pest problem and justification.

III. Experimental Plan

1. Provide a numerical list of all treatments including the products, rate (units), application timing, etc. A **majority** of the treatments must be **biopesticides (see** www.epa.gov/pesticides/biopesticides/ingredients/index.htm.)**.**

2. What crops or sites will this study be conducted on?

3. What experimental design will be utilized? (Such as Randomized Complete Block. Will there be a complete factorial arrangement of treatments? Also include plot size, statistical tests, etc. Please see section **Treatment lists and design of biopesticide studies on page 37**). Note: EPA requires an Experimental Use Permit if the total treated area is above 10 acres. It may also require destruction of a food crop if there is no existing tolerance. Please document the existence of an EUP if applicable.

4. How many locations (field or greenhouse)? How many replications?

5. Describe how this proposal is designed to provide information on how it fits into an integrated pest management program.(Note: We favor proposals that determine the utility of biopesticides as early season treatments or in rotation with conventional products, rather than only a direct comparison of conventionals versus biopesticides Please see section: **Treatment lists and design of biopesticide studies on page 37.** Keep in mind that the data need to be sufficient to determine the value of the biopesticide product to the pest control program.

6. Data collection – (Describe what data will be collected such as crop yields, crop quality, etc. If visual efficacy evaluations will be collected, describe the rating scale used and the evaluation timings).

7. Describe the pests to be controlled, the degree to which they are a problem in your state or region and the frequency that they occur (season long problem, every year, every few years).

8. Will the crop be inoculated with the target pest or otherwise be brought into the test system to ensure that it will be available for evaluation? If not, describe the frequency of occurrence.

9. What is the proposed start date and completion date? Also describe this in chronological order in the context of the experimental plan.

10. Describe the test facilities where these studies will be conducted.

11. Budget: Provide an itemized budget, with categories such as labor, supplies, travel, etc. Provide a grand total. **Note: Overhead costs are not permitted.** Funding is only awarded on a per year basis, so if this is a multiple year proposal, divide the budget for each year. Also include a list of support from the registrant and/or other sources. Provide information on other sources of monetary support and in-kind contributions from growers (land, plant material, etc).

12. Describe why this product is needed and why growers are likely to use this product. (Also list alternative conventional and biopesticide treatments)

Note: See appendix for attachment of additional information.

Appendix 1

Registrant support. Please submit your proposal to the registrant and request the registrant or potential registrant fill out the registrant questionnaire form and submit this to IR-4. Letters of support from the registrant as well as grower or commodity groups are encouraged.

Appendix 2

PCR Forms. Please fill out the attached Project Clearance Request Form for each biopesticide/crop combination involved in your proposal. (Not needed for Demonstration Stage Proposals).

Appendix 3

Labels – Supply the label or the proposed label of the biopesticide(s) to be evaluated. **(Note:** Labels of conventional products are not needed.).

Appendix 4

Supporting preliminary data (Attach tables, graphs of the current data that coincide with the proposed use. Do not only list literature citations. If appropriate, attach actual literature. **Note: Proposals without supporting data are less likely to be funded**.

Appendix 5

Attach resume for Principal Investigator and Co-PI's. Please limit the size of resumes as much as possible to reflect expertise pertinent to the proposed research. Please do not submit an exhaustive list of publications. Only those showing experience with the crop and pest in the proposal and any experience with biopesticides.

Appendix 6

If you were funded last year, submit a progress or final report. This must be submitted regardless of whether or not the current proposal is related to the previous one.

Appendix 1—Registrant Questionaire

Please fill out the first page of this form for each crop/biopesticide combination and send to the registrant.

Registrant please return to IR-4 Project Headquarters, Michael Braverman, Biopesticide Program Manager, 500 College Road East; Suite 201 W; Princeton, NJ 08540-6635, Tel: (732) 932-9575 ext. 4610, Fax: (609) 514-2612, braverman@aesop.rutgers.edu

Principal Investigator: _____

Address: _____
_____
_____

Telephone: _____

Proposal Title: _____

Registrant name and address: _____
_____
_____

Product Name: _____ Active Ingredient:_____

Trade Name: _____

The following section is to be completed by the Biopesticide Registrant. The PCR form is to be completed by the researcher for Early and Advanced Stage Proposals (Due Nov. 14)

1) Is this product EPA registered through BPPD? Yes_____ No_____

Is this use covered by your current label? Yes_____ No_____

If this product is not yet registered with EPA, describe where you are at in collecting the toxicology data or Stage of the registration process. If this project was previously funded, describe how the registration status has changed since last year.

Is label and toxicology work currently limiting product only to non-food uses?

2) Assuming the efficacy data are favorable, what is the likelihood that this use will be added to your label?

3) Considering the use rate(s), what is considered to be the farm-level cost for the treatment in $/acre?

4) How would you rank the importance of the proposed use compared to other potential uses?

5) If you are only considered a potential registrant (do not currently own rights to the product), rank your degree of interest in this product.

6) Were you involved or consulted in the development of the treatments or proposal?

7) What financial support are you planning on providing, if any?

_____ _____

Name of Registrant representative Date

_____

Title

Other comments – Please attach a letter of support for this project by November 14, 2006

FOR OFFICE USE ONLY
Date:_____
Cat:_____PR#:_____

IR-4 Minor Use Biopesticide (*Required Fields)
Project Clearance Request (PCR) Form

1. ***Requestor:**_____Affiliation:_____
***Address:**_____
***City:**_____*State/Territory:_____*Zip:_____
***Telephone:** (_____)_____FAX: (_____)_____
***E-mail address:**_____

2. ***Pest Control Product (Active Ingredient {a.i.}):**_____
***Trade Name/Formulation:**_____
Registrant (manufacturer):_____
Method of Production (Fermentation, in vivo, extraction from plants):_____

3. ***Commodity (one crop or crop group per form):**_____
***Use Site (e.g., field, greenhouse, post-harvest):**_____
Parts Consumed:_____Animal Feed By-Products: Yes___No___
Planting Season:_____Harvest Season:_____
State/Territory Acreage:_____% National:_____Average Field Size:_____

4. **Insect/Disease/Weed:**_____
Damage caused by pest:_____

5. ***Why is this use needed?:**_____

6. ***Proposed Label Instructions**
***Rate per Application (lbs a.i. per acre or 1000 linear ft):**_____
Type of sprayers that may be used (e.g., fixed wing, ground boom sprayer, chemigation, air blast, ULV, granular spreader):_____
Range of Spray Volume (if applicable):_____
Maximum Acreage Treated per Day:_____
***Crop Stage during Application(s):**_____
***Maximum no. of applications:** _____Minimum interval betw. applications:_____
Maximum lbs active ingredient per acre per year/season: _____***PHI:**_____

7. ***Availability of Supporting Data[1]: ***Phytotoxicity(P) ____ ***Efficacy(E) ___ ***Yield(Y)___
[1]Supporting data may be required before a residue study will be initiated.

8. Brief Summary of proposed study and fund request: _____
_____

9. ***Submitted By (print name):** _____
Signature:**_____Date:**_____

Send this <u>completed</u> form to:

IR-4 Project Headquarters, 500 College Road East; Suite 201 W; Princeton, NJ 08540-6635;
Telephone (732)932-9575 ext 4610 (Michael Braverman) FAX (609) 514-2612
or e-mail: braverman@aesop.rutgers.edu

Final Report

Recipients are also required to submit **two (2) copies** of a Final Report consisting of:

A one page Executive Summary describing the project and its accomplishments that could be used in a press release.

A standard scientific format of abstract, introduction, materials and methods, statistically analyzed data in tables or graphs and a results and discussion section;

An electronic version of the Executive Summary and Final Report on a 3.5@ diskette or CD in MS Word or Corel WordPerfect for Windows format;

The Final Report is due 30 days following the completion of the projection or end of the project period whichever comes first. **Any materials published whether print, video, etc. must include language that funding was provided in whole (or part) by the IR-4 Project.**

Deadline:

Proposals must be received at the IR-4 Project Headquarters offices, 500 College Road East; Suite 201 W; Princeton, NJ 08540-6635, on or before 5:00 p.m. Eastern Time, November 14, 2006. The review and selection timing is dependent upon when funds are made available to the IR-4 Project.

Address:

Submit one original copy of the proposal and the electronic version to Dr. Michael Braverman, 500 College Road East; Suite 201 W; Princeton, NJ 08540-6635; Tel: 732-932-9575, ext. 4610; Fax: 609-514-2512; e-mail: Braverman@aesop.rutgers.edu.

Budget:

Provide an itemized budget, with categories such as labor, supplies, travel, etc. Provide a grand total. **Note: Overhead costs are not permitted.** Funding is only awarded on a per year basis so if this is a multiple year proposal, divide the budget for each year. Also include a list of support from the registrant or other sources. Provide information on other sources of monetary support and in-kind contributions from growers (land, plant material, etc).

BIOPESTICIDE PROJECT BUDGET

Project Period: From: **To:**

		Totals ($)
A. Senior/Key Person		
B. Other Personnel		
Total Number, Other Personnel		
C. Fringe Benefits		
Total Salary, Wages and Fringe Benefits		**$**
D. Equipment		**NOT ALLOWED**
E. Travel		**$**
1. Domestic		
2. Foreign	**NOT ALLOWED**	
F. Participant Support Costs		**$**
1. Travel		
2. Other		
G. All Other Direct Costs		**$**
1. Materials and Supplies		
2. Publication Costs		
3. Consultant Services		
4. Computer Services		
5. Subawards/Consortium/Contractual Costs		
6. Equipment or Facility Rental/User Fees		
7. Alterations and Renovations	**NOT ALLOWED**	
8. Other 1		
9. Other 2		
10. Other 3		
Total Direct Costs		**$**

****Each budget item requires documentation****

****IMPORTANT****

On a separate sheet provide the following information:
Project title, PI name and one paragraph statement of work
Identify each budget item individually - provide cost and a written description and/or purpose for the cost
For rentals and fees: identify type of rental or fee and provide rental rate & purpose for the cost
Any contractual work will require a separate budget and statement of work including rate and purpose

The Other category **MAY NOT** include construction or indirect overhead.
These costs are not permitted, under any circumstances, under this grant.

[1]Indicate in a footnote if the matching funds are monetary or in kind and their source

BIOPESTICIDE

DEMONSTRATION

GRANT

PROPOSAL

FORMS

2007

(Proposals due November 14, 2006)

IR-4/EPA Biopesticide Demonstration Grants

Project Grants 2007: Request for Proposals

The Biopesticide Demonstration Grants are administered by Interregional Research Project Number 4, under a cooperative agreement with the U.S. Environmental Protection Agency's Biopesticides and Pollution Prevention Division of the Office of Pesticide Programs. **The goal is to enhance the adoption of biopesticides in agricultural and non-agricultural settings in the U.S.**

This call is open to:

Organizations involved in work that can enhance the adoption of registered biopesticides in agricultural and non-agricultural settings. Teams comprised of organizations representing the biopesticide industry, grower and land grant university communities are invited to submit proposals. Biopesticide and conventional pesticide companies are urged to cooperate in developing proposals to demonstrate biologically-intensive Integrated Pest Management (IPM) systems.

Focus of Projects:

Projects should focus on the field demonstration of the effective use of biopesticides within biologically-intensive Integrated Pest Management (IPM) systems. Such systems may include novel combinations of biopesticides to enhance product performance, as well as those which integrate biological approaches into existing agricultural production systems using conventional products, as a means to reduce potential risks associated with agrichemical use. Capital improvement projects and projects that focus solely on research are not permitted under this award.

Funding Limit:

These grants will fund up to $25,000 of project costs. **Indirect overhead costs are not permitted.** $200,000 is expected to be available, dependant on BPPD funding transfer to IR-4 and IR-4's FY 2007 budget. **Successful applicants will be notified when funding will be available.** The biopesticides utilized in this demonstration project must already be approved for use by the Biopesticide and Pollution Prevention Division of EPA. See the list at:
http://www.epa.gov/pesticides/biopesticides/ingredients/index.htm.

IR-4/EPA BIOPESTICIDE DEMONSTRATION GRANTS COVER PAGE

2007

Proposal Number(For IR-4 Use):	Principal Investigator:
Proposal Title:	
Institution:	
Total dollars Requested (Year 1 only)	

Enter each biopesticide /crop/ pest combination

No.	Biopesticide and/or Conventional Product	Crop	Pest (Weeds, Diseases, Insects)	PR Number(For IR-4 Use)
1				
2				
3				
4				
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26				

9/1/2006

Biopesticide Grants Contact Information Form

Proposal Title: _____

Name	Address: Street	City/State	Zip+4	Phone Number & Fax Number	E-mail Address
Project Director (*Principal Investigator*):					
Administrative Contact:					
Financial Grant Officer:					
Authorized Grant Official:					
Individual Responsible for Invoicing:					

NOTE: THIS IS FOR INFORMATIONAL PURPOSES ONLY. THIS IS NOT MEANT TO BE SIGNED. DO NOT DELAY SUBMITTING YOUR PROPOSAL BY ATTEMPTING TO GET THIS SIGNED. THIS IS NOT MEANT AS A REPLACEMENT FOR ANY INSTITUTIONAL APPROVAL PAGES.

Application Process:

Proposals must include the following sections: **(Note: Answer the following point by point rather than as a narrative.)**

1. Principal Investigator and Project Officer (if different) and principal members of the project team if more than one organization is participating. Include name, address, phone, fax and e-mail address (must be on first/title page)

2. Explain how each member of the team contributes to the project.

3. Executive Summary (not to exceed 1 page);

4. Rationale/Need for project / Project objectives;

5. Likelihood of broader adoption by grower community. Describe how you will measure the impact of this project on grower adoption.

6. Description of anticipated risk reduction.

7. Criteria used to measure risk reduction.

8. Provide a numerical list of all treatments including the products, rate (units), application timing, etc.

9. What crops or sites will this study be conducted on?

10. What experimental design will be utilized? (Such as Randomized Complete Block. Will there be a complete factorial arrangement of treatments? Also include plot size, statistical tests, number of replications etc.).

11. How many locations (field or greenhouse)?

12. Describe how this proposal is designed to provide information on how it fits into an integrated pest management program. (Note: We favor proposals that determine the utility of biopesticides as early season treatments, in rotation with conventional products, or in combination with other biopesticides rather than only a direct comparison of conventionals versus bipoesticides). Keep in mind that the data need to be sufficient to determine the value of the biopesticide product to the pest control program.

13. Data collection (Describe what data will be collected such as crop yields, crop quality, pest control efficacy, etc. If visual efficacy evaluations will be collected, describe the rating scale used and the evaluation timings).

14. Describe the pests to be controlled, the degree to which they are a problem in your state or region and the frequency that they occur (season long problem, every year, every few years).

15. Will the crop be inoculated with the target pest or otherwise be brought into the test system to ensure that it will be available for evaluation? If not, describe the frequency of occurrence.

16. What is the proposed start date and completion date? Also describe this in chronological order in the context of the experimental plan.

17. Describe the test facilities where these studies will be conducted (growers field, university research station).

18. Describe why this product is needed and why growers are likely to use this product. (Also list alternative conventional and biopesticide treatments)

19. Describe the extension/outreach component of your demonstration project (talks, publications, etc.).

20. **Labels** - Supply the labels or the proposed labels of the biopesticides to be evaluated. **Note:** This program only funds proposals involving biopesticides that are already labeled for the use being demonstrated in this project.

21. **Supporting preliminary data** (Attach tables, graphs of the current data that coincide with the proposed use. Do not only list literature citations. If appropriate, attach actual literature.)

22. Attach resume for Principal Investigator and Co-PI's.

23. Completed budget form (attached to RFP). Also provide an itemized budget, with categories such as labor, supplies, travel, etc. Provide a grand total. **Note: Overhead costs are not permitted.** Funding is only awarded on a per year basis so if this is a multiple year proposal, divide the budget for each year. Also include a list of support from the registrant and/or other sources. Provide information on other sources of monetary support and in-kind contributions from growers (land, plant material, etc).

The following criteria must also be met:

An original copy of the proposal must be submitted; and
an electronic version of the proposal must be submitted on a 3.5@ diskette or CD in
MS Word for Windows or Corel WordPerfect for Windows format;

Any proposal deviating from this format and not including the specified sections will not be considered for funding.

CRITERIA FOR EVALUATION OF BIOPESTICIDE DEMONSTRATION PROJECT PROPOSALS

1. Adequacy of investigators, facilities, work plan and background research.
2. Evidence of efficacy. Positive supporting data provided.
3. Does experimental design allow the determination of performance relative to conventional control practices and how the biopesticide might fit into IPM programs?
4. Evaluation of budget.
5. Risk reduction impact (OP replacement, MeBr replacement, children's dietary crop, etc.)
6. Potential impact of the project, site in a major region for that crop, degree of grower/ commodity group involvement in the study and extension component- outreach program.).
7. Other biopesticide control measures currently available to control target pest. (Lower rating if other biopesticide options exist, higher rating if few options exist)
8. Monetary support from registrant and/or and participation by grower/commodity partner.
9. Probability of biopesticide being used by growers-factors such as effectiveness, organic status and economics of use rates should be considered.
10. Probability of project completion based on timetable presented.
11. Method of assessing grower adoption.
12. Probability of impact on extension, pest control advisors, agrichemical distributors and other key influencers.
13. Evidence of cooperation between (among) two or more biopesticide/conventional crop protection companies involved in the demonstration.

Requirements:

Project must be completed within 12 months of the starting date.

All awards are subject to an audit by the EPA and IR-4.

Final Report

Recipients are also required to submit **two (2) copies** of a Final Report consisting of:

A one page Executive Summary describing the project and its accomplishments that could be used in a press release; Special emphasis should be given to the adoption of biopesticides, measurable risk reduction outcomes of the project;

A standard scientific format of abstract, introduction, materials and methods, statistically analyzed data in tables or graphs and a results and discussion section.

A news release (in standard release format) describing your project and its accomplishments;

A list of media outlets (local newspapers, radio and television stations, industry publications, commodity journals, etc.) that may be interested in receiving the news release on the project; and

An electronic version of the Executive Summary, Final report, news release, and list of media outlets on a 3.5"diskette or CD in MS Word or Corel WordPerfect for Windows format.

The Final Report is due 30 days following the completion of the projection or end of the project period whichever comes first. **Any materials published whether print, video, etc. must include language that funding was provided in whole (or part) by the IR-4 Project under a cooperative agreement with the U.S. Environmental Protection Agency.**

Deadline:

Proposals must be received at the IR-4 Project offices, on or before 5:00 p.m. Eastern Time, November 14, 2006. The review and selection timing is dependent upon when funds are made available to the IR-4 Project. Applicants will be notified by e-mail of review and selection timing once finalized.

Address:

Submit one original copy of the proposal and the electronic version to
Dr. Michael Braverman,
Biopesticide Program Manager
500 College Road East, Suite 201W
Princeton, New Jersey 08540
Tel: (732) 932-9575 ext 4610
Fax: (609) 514-2612

Budget:

Provide an itemized budget, with categories such as labor, supplies, travel, etc. Provide a grand total. **Note: Overhead costs are not permitted.** Funding is only awarded on a per year basis so if this is a multiple year proposal, divide the budget for each year. Also include a list of support from the registrant or other sources. Provide information on other sources of monetary support and in-kind contributions from growers (land, plant material, etc).

BIOPESTICIDE PROJECT BUDGET

Project Period: From: **To:**

		Totals ($)
A. Senior/Key Person		
B. Other Personnel		
Total Number, Other Personnel		
C. Fringe Benefits		
Total Salary, Wages and Fringe Benefits		**$**
D. Equipment		**NOT ALLOWED**
E. Travel		**$**
1. Domestic		
2. Foreign	**NOT ALLOWED**	
F. Participant Support Costs		**$**
1. Travel		
2. Other		
G. All Other Direct Costs		**$**
1. Materials and Supplies		
2. Publication Costs		
3. Consultant Services		
4. Computer Services		
5. Subawards/Consortium/Contractual Costs		
6. Equipment or Facility Rental/User Fees		
7. Alterations and Renovations	**NOT ALLOWED**	
8. Other 1		
9. Other 2		
10. Other 3		
Total Direct Costs		**$**

****Each budget item requires documentation****

****IMPORTANT****

On a separate sheet provide the following information:
Project title, PI name and one paragraph statement of work
Identify each budget item individually - provide cost and a written description and/or purpose for the cost
For rentals and fees: identify type of rental or fee and provide rental rate & purpose for the cost
Any contractual work will require a separate budget and statement of work including rate and purpose

The Other category **MAY NOT** include construction or indirect overhead.
These costs are not permitted, under any circumstances, under this grant.

[1]Indicate in a footnote if the matching funds are monetary or in kind and their source

Treatment lists and design of biopesticide studies.

We encourage individuality and originality of research and proposal design. There are certainly many other possibilities than the designs proposed here. Most of these also assume there is a pest management system that requires multiple applications. This is just a guide to encourage consideration of how the products can fit into a pest control system.

Just like conventional products, pest type , pest size, population , application timing and other factors can influence pest control activity of biopesticides. IR-4 has seen research where the biopesticide products were superior to conventionals and ones where they had no activity. Often biopesticide products are not capable of season long control when used alone. It is important to know both the activity of the products alone as well as in combinations so that the contribution of each product can be determined. The integration of biopesticides and conventional products through rotations, combinations, and threshold analysis are the core of our IPM philosophy and facilitates resistance management , worker safety, consumer interest and grower flexibility.

For products in which only very preliminary efficacy data are available such as in Early Stage proposals, it is recommended that products be evaluated at multiples of 1, 2 and 4 times the anticipated labeled rate to increase the likely hood of developing positive efficacy data. We recognize that there are some products that do not lend themselves to traditional treatment combinations. There also many pest problems where there are no registered products for comparison. If this is the case discuss the reasons with your Regional/ ARS Coordinators or the IR-4 Biopesticide Program Manager.

A. Alternating design

Some type of alternation between biopesticides and conventional products can be useful in managing pesticide resistance. This type of study is especially useful in a site where resistance to the conventional product exists

1. Biopesticide Product #1 (BP1) season long
2. Biopesticide Product #2 (BP2) season long
3. Biopesticide Product #3 (BP3) season long
4. Biopesticide Product #4 (BP4) season long
5. Conventional Standard (CS) season long
6. CS alternated with BP1
7. CS alternated with BP2
8. CS alternated with BP3
9. CS alternated with BP4
10. Control

B. Threshold design

In some cases economic thresholds for pest populations may be known, but the same threshold level may not be appropriate for biopesticides. If the biopesticide is slower acting or is not capable of controlling larger pests, using the biopesticide early season until it reaches a certain threshold may be a way to delay the need for a conventional product. This assumes that a threshold for conventional products is already known.

1. BP until 25% of threshold followed by conventional pesticide until back below 25%
2. BP until 50% of threshold followed by conventional pesticide until back below 50%
3. BP until 75% of threshold followed by conventional pesticide until back below 75%
4. BP until 100% of threshold followed by conventional pesticide until back below 100%
5. BP alone season long,
6. Conventional pesticide alone season long
7. Control

C. Residue reduction- or short Pre Harvest Interval design.

When crops need to be harvested, pesticide application of conventional products may be limited by the allowable period between pesticide application and harvest(Preharvest interval). There may be a need for a biopesticide which has no limitation on application to harvest period. This is especially true in cases where there are multiple harvests which preclude application of conventional products. Pests that blemish maturing fruit or affect post harvest storage may need to be controlled.

1. Conventional season long(as long as legally possible according to pre harvest interval).
2. Conventional season long plus an additional application of BP#1 just before harvest (or additional applications in multiple harvest crops).
3. Conventional season long plus an additional application of BP#2 just before harvest(or additional applications in multiple harvest crops).
4. Conventional season long plus an additional application of BP#3 just before harvest (or additional applications in multiple harvest crops).

5. Conventional season long plus an additional application of BP#4 just before harvest. (or additional applications in multiple harvest crops).
6. Control

D. Short re-entry time design.

Manual operations in the field may be dictated by restricted entry intervals in which protective clothing may be needed that can hinder the efficiency and safety of workers. Operations such as moving irrigation pipe, thinning, pruning, staking, etc may need to be performed, but workers can not easily enter fields due to reentry restrictions. The concept here is to utilize conventional products for part of the season when these critical operations are not needed and use biopesticides whose reentry interval does not inhibit workers from performing those operations.

1. Conventional until critical reentry period
2. Conventional until critical reentry period plus BP#1 just before reentry followed by conventional rest of season
3. Conventional until critical reentry period plus BP#2 just before reentry followed by conventional rest of season
4. Conventional until critical reentry period plus BP#3 just before reentry followed by conventional rest of season
5. Conventional until critical reentry period plus BP#4 just before reentry followed by conventional rest of season

E. Activity combinations

Pheromones are useful in disrupting mating, can be attractants or otherwise interfere with normal insect activity. Plant defense elicitors can trigger the plant to prepare it for protecting against invasions by plant pathogens and products can also be part of an overall system with other biopesticides that have more focused activity on the pest.

1. Pheromone or plant defense elicitor (SAR Product)alone
2. Pheromone or plant defense elicitor in combination with biopesticde #1
3. Pheromone or plant defense elicitor in combination with biopesticde #2
4. Pheromone or plant defense elicitor in combination with biopesticde #3
5. Pheromone or plant defense elicitor in combination with biopesticde #4
6. Pheromone or plant defense elicitor in combination with conventional
7. Biopesticide #1 alone.
8. Biopesticide #2 alone.
9. Biopesticide #3 alone.
10. Biopesticide #4 alone.
11. Conventional alone.
12. Control

Types of designs we do **not** prefer

A. **We do not accept biopesticide add on projects:**

This type of treatment list is not acceptable because the proposal guidelines require a majority focus on biopesticides. We encourage having a commercial standard for comparison but a majority of the study must involve biopesticides. This design has no integration of the biopesticides and conventional products therefore it is overlooking a potentially successful treatment regime.

1. Conventional Product #1
2. Conventional Product #2
3. Conventional Product #3
4. Biopesticide #1
5. Biopesticide #2
6. Control

B. **We do not prefer head to head comparisons:**

This study only looks at one product and does not integrate the biopesticide and conventional treatments.

1. Biopesticide Rate 1
2. Biopesticide Rate 2
3. Biopesticide Rate 3
4. Conventional
5. Control

C. **We do not prefer combinations without clear contribution:**

While we encourage comparisons of combinations (especially if they can be used to reduce rates of conventional products), there should be a way to know what the biopesticide and conventional products are contributing to the overall control. It may be that the conventional or biopesticide alone may have achieved as good a level of control as the combination.

1. Biopesticide #1 tank mixed with Conventional #1
2. Biopesticide #1 tank mixed with Conventional #2
3. Biopesticide #2 tank mixed with Conventional #2
4. Biopesticide #2 tank mixed with Conventional #2
5. Control

D. **We do not prefer studies that leave out existing options**.

Some pest problems such as powdery mildew have a relatively large number of biopesticides on the market labeled for their control. Therefore, when designing studies for new products, established biopesticide products should also be compared to the new product just as they would be compared to a conventional product. Therefore, the following treatment list is too shallow. Note: powdery mildew is just mentioned as an example here. There may be other pest problems such as Bt's for lepidopterous larvae or oils for mites which there are numerous existing options. If there is already evidence that the established biopesticide does not work on the particular disease/crop combination, then that should be documented as to explain why the treatment was not included. This is also important in that we tend to favor research in which there are no, or limited options.

1. New powdery mildew biopesticide
2. Conventional
3. Conventional alternated with biopesticide
4. Control

2006 GRANT AWARDS

Title	Researchers	University	Grant Stage
Evaluation of VacciPlant (Physpe 4), a Plant Activator for the Control of the Blossom and Shoot Blight Phases of Fire Blight	George W. Sundin	Michigan State University	EARLY
Evaluation of Vacciplant for Management of Fire Blight	Herb S. Aldwinckle	Cornell University	EARLY
Determine the Potential of Products Affecting Plant Hormones with Micronutrients for Management of Onion Thrips	Tong-Xian 'T.-X' Liu	Texas A&M Univ. System-Texas Agricultural Experiment Sta.	EARLY
Evaluation of Phomopsis amaranthicola for Palmer Amaranth Control	Gregory E. MacDonald	University of Florida - IFAS	EARLY
Raspberry Ketone Formate for Attract and Kill of Melon Fly	Eric Jang	USDA-ARS-USPBARC	EARLY
Enhancement of Baits for the European fire Ant With Pheromone - Phase II	Francis A. Drummond & Eleanor Groden	University of Maine	EARLY

Phytophthora and Rhizoctonia Control in Ornamentals with EcoGuard	D. M. Benson	North Carolina State University	ADVANCED
Evaluation of Spinosad with Min-U-Gel, Actigel, or Splat as a Replacement for Naled and Min-U-Gel for Reduced Risk Male Annhilation Treatments (with Methyl Eugenol and Cue-Lure) against Oriental Fruit Fly and Melon Fly	Roger I. Vargas	USDA-ARS-PBARC	ADVANCED
Improved Thrips Management in Greenhouse Ornamentals Production	Christine Casey	North Carolina State University	ADVANCED
Integration of BlightBan C9-1 and BlightBan A506 plus C9-1 with Conventional Fire Blight Management	Kenneth B. Johnson	Oregon State University	ADVANCED
Ammonium Pelargonate as a Bioherbicide in Plasticulture	Mark VanGessel	University of Delaware	ADVANCED
Evaluation of Bacterial Antagonists for the Control of the Blossom Blight Phase of Fire Blight	George W. Sundin	Michigan State University	ADVANCED
Efficacy and Compatibility of Biofungicides with Commonly Used Soil Fungicides in Production of Herbaceous Perennials	William Kirk, Phillip Wharton	Michigan State University	ADVANCED
Evaluation of Serenade and Muscodor for Efficacy Against Fungal Pathogens of Ornamentals	Dr. Reddy Munagala	Auburn University	ADVANCED
Biopesticide Control of Citrus Red Mite, Citrus Rust Mite, and Soft-Bodied Insects in Satsuma Mandarin	Henry Y. Fadamiro	Auburn University	ADVANCED
Soil and Seed Treatments for the Management of Phytophthora Blight and Pythium Root Rot of Pepper	Sally A. Miller	The Ohio State University	ADVANCED
Evaluation of Yield Shield as a Seed Treatment for Ginseng	Mary A. Hausbeck	Michigan State University	ADVANCED

Title	Researchers	University	Grant Stage
Chancellor ST and WD Efficacy for Nematode Control in Michigan	George W. Bird	Michigan State University	ADVANCED
Integration of Biopesticides for Control of Cranberry Cottonball Disease and Fungicide Resistance Management	Patricia McManus	University of Wisconsin	ADVANCED
Evaluating Biopesticides for Disease Control in Grapes	Annemiek Schilder	Michigan State University	ADVANCED
Evaluating Biopesticides for Disease Control in Blueberries	Annemiek Schilder	Michigan State University	ADVANCED
Evaluation of a Biopesticide Active Ingredient, Bacillus firmus at Different Concentrations and Combinations as an Alternative to Soil Fumigation for Potato Nematode Management	Saad L. Hafez	University of Idaho	ADVANCED
Efficacy and Compatibility of Biofungicides and Reduced Risk Fungicides as Metalaxyl Alternatives for the Control of Oomycetes in Perennials	William Kirk, Phillip Wharton	Michigan State University	ADVANCED
Phosphite and Biofungicide Products at the Advanced Stage of Development Evaluated for Phytophthora Blight in Pumpkin	Margaret Tuttle McGrath	Cornell University	ADVANCED
Biological Control of Invasive Woody Weeds in Parks, Urban Areas and Landscapes with Chondrostereum Purpureum	Joseph C. Neal and D. Michael Benson	North Carolina State University	ADVANCED
Evaluation and Comparison of Biofungicides and fungicides for the Control of Post Harvest Potato Tuber Diseases	William Kirk, Phillip Wharton	Michigan State University	ADVANCED
Mycotal for Hemlock Wooly Adelgid Management	Scott D. Costa	University of Vermont	ADVANCED
Evaluation and Incorporation of the Fungus Beauvaria bassiana, for Control of Plum Curculio in Commercial Tart Cherry and Apple Production	Mark Whalon	Michigan State University	DEMONSTRATION
Promoting Expanded Adoption of Biopesticide-Based Codling Moth Management Through the Use of Machine Applied Mating Disruption Formulations	Larry Gut	Michigan State University	DEMONSTRATION
Management Programs for Internal Lepidoptera in Apples Using Granulosis Virus, Pheromone Mating Disruption, and In-Season Fruit Damage Inspection	Arthur M. Agnello	Cornell University	DEMONSTRATION
Demonstrating the Role and Assessing the Safety of Endorse for Alternaria and Botrytis Management in Ginseng	Mary K. Hausbeck	Michigan State University	DEMONSTRATION
Biofungicides with Efficacy for Controlling Dollar Spot of Bermudagrass	Mario Tomaso-Peterson	Mississippi State University	DEMONSTRATION
Effectiveness of Serenade, Sonata and Prophyt Within a Biopesticide Intensive IPM System for Management of Downy Mildew on Broccoli	Michael E. Matheron	University of Arizona	DEMONSTRATION
Integration of Serenade into Mummyberry Management Programs	J. W. Pscheidt	Oregon State University	DEMONSTRATION
Effectiveness of Serenade, Sonata and Kaligreen Within a Biopesticide Intensive IPM System for Management of Powdery Mildew on Cantaloupe	Michael E. Matheron	University of Arizona	DEMONSTRATION
Botanical Oil, Potassium Bicarbonate, and Biofungicide Products at the Advanced or Demonstration Stage of Development Evaluated for Powdery Mildew in Pumpkin	Margaret Tuttle McGrath	Cornell University	DEMONSTRATION
Control of Brown Rot and Mucor Rot in Cherries with Arabesque Muscodor albus)	Robert A. Spotts	Oregon State University	DEMONSTRATION

Title	Researchers	University	Grant Stage
Application of Diallyl disulfide (DADS) to Stimulate Sclerotial Germination of Sclerotium cepivorum for the Control of White Rot of Garlic	R. Michael Davis	University of California, Davis	DEMONSTRATION
Control of Grapevine Powdery Mildew with Biofungicides	Wayne F. Wilcox	Cornell University, NYSAES	DEMONSTRATION
Phosphite and Biofungicide Products at the Demonstration Stage of Development Evaluated for Phytophthora Blight in Pumpkin	Margaret Tuttle McGrath	Cornell University	DEMONSTRATION
Use of Phosphite Materials for Control of Pythium Species in High-Density blueberry Production Systems	Phillip M. Brannen	University of Georgia	DEMONSTRATION
Effectiveness of Biofungicides and Reduced Rate of Fungicide Application in Management of Soilborne Diseases of Peanut	Soum Sanogo	New Mexico State University	DEMONSTRATION
Efficacy of Seed and Transplant Treatment with Streptomyces-based and Bacillus-based Biofungicides in Control of Phytophthora Blight on Chile Pepper	Soum Sanogo	New Mexico State University	DEMONSTRATION
Efficacy of High Release Rate MCH Dispensers to Prevent Douglas-fir Beetle Infestation	Darrell W. Ross	Oregon State University	DEMONSTRATION